

CLAIMS

What is claimed is:

1. A semiconductor package, comprising:

5 a semiconductor chip having a first face and an opposite second face, the first face having a plurality of input/output pads thereon;

10 a circuit board having a first face, an opposite second face, a through hole between the first and second faces, and an electrically conductive circuit pattern layer on the first face, wherein the semiconductor chip is within the through hole and the first face of the semiconductor chip faces in a same direction as the first face of the circuit board;

15 a plurality of electrical conductors that electrically connect the input/output pads of the semiconductor chip to the circuit pattern of the first face of the circuit board;

an encapsulant that covers the semiconductor chip, electrical conductors, and at least part of the first face the circuit board, and is within the through hole; and

20 a plurality of conductive balls fused to the circuit pattern on the first face of the circuit board.

2. The semiconductor package of claim 1, further comprising a metal thin film covering the second face of the circuit board and the second face of the semiconductor chip.

25 3. The semiconductor package of claim 2, wherein the circuit board has a conductive via hole which electrically connects the circuit pattern layer formed on the first face of the circuit board to the metal thin film.

4. The semiconductor package of claim 1, wherein the circuit board has a second circuit pattern layer on the second face of the circuit board.

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5. The semiconductor package of in claim 4, wherein the circuit board has a via hole which electrically connects the circuit pattern layer on the first face of the circuit board to the second circuit pattern layer on its second face.

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6. The semiconductor package of claim 1, wherein the second face of the semiconductor chip is exposed.

7. The semiconductor package of claim 1, further
15 comprising a heat spreading plate on the second face of the circuit board and the second face of the semiconductor chip.

8. The semiconductor package as claimed in claim 1,
further comprising a heat spreading plate, said plate located
20 only on the second face of the circuit board.

9. The semiconductor package as claimed in claim 1,
wherein the second face of the semiconductor chip, the second
face of the circuit board, and a first face of the encapsulant
25 are in the same plane.

10. The semiconductor package of claim 9, wherein an insulating film is attached to the second face of the

semiconductor chip, the second face of the circuit board, and the first face of the encapsulant.

11. The semiconductor package of claim 1, further
5 comprising a conductive metal thin film on the second face of the semiconductor chip, the second face of the circuit board, and a co-planar first face of the encapsulant.

12. The semiconductor package of claim 1, further
10 comprising a conductive ink film on the second face of the semiconductor chip, all or part of the second face of the circuit board, and a first face of the encapsulant.

13. The semiconductor package of claim 2, further
15 comprising a conductive ink film on the second face of the semiconductor chip, a first face of the encapsulant, and all or part of the metal thin film.

14. The semiconductor package of claim 13, wherein the
20 conductive ink film includes a design or mark.

15. The semiconductor package of claim 1, wherein the electrical conductors are bond wires.

25 16. The semiconductor package of claim 1, wherein the package is rectangular with orthogonal peripheral sides, wherein a portion of the circuit board is exposed at the peripheral sides.

17. The semiconductor package of claim 5, wherein
conductive balls are fused to the second circuit pattern layer.

18. The semiconductor package of claim 4, further
5 comprising a second semiconductor chip mounted on the second
face of the first semiconductor chip.

19. The semiconductor package of claim 6, wherein the
package is rectangular with orthogonal peripheral sides, wherein
10 a portion of the circuit board is exposed at the peripheral
sides.

20. The semiconductor package of claim 8, wherein the
package is rectangular with orthogonal peripheral sides, wherein
15 a portion of the circuit board is exposed at the peripheral
sides.

21. The semiconductor package of claim 9, wherein the
package is rectangular with orthogonal peripheral sides, wherein
20 a portion of the circuit board is exposed at the peripheral
sides.

22. The semiconductor package of claim 10, wherein the
package is rectangular with orthogonal peripheral sides, wherein
25 a portion of the circuit board is exposed at the peripheral
sides.

23. The semiconductor package of claim 11, wherein the
package is rectangular with orthogonal peripheral sides, wherein

a portion of the circuit board is exposed at the peripheral sides.

24. The semiconductor package of claim 12, wherein the
5 package is rectangular with orthogonal peripheral sides, wherein
a portion of the circuit board is exposed at the peripheral
sides.